

REMARKS

This is a full and timely response to the final Official Action mailed May 12, 2004 (Paper No. 7). Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claims 10-12, 19, 23 and 24 are amended herein. Claims 1-6 are cancelled without prejudice or disclaimer. No new claims have been added. Thus, claims 7-29 are currently pending for further consideration.

In the outstanding Office Action, the Examiner indicated the allowance of claims 7-9, 15-17, 28 and 29. Applicant wishes to thank the Examiner for the allowance of these claims.

The Examiner further indicated the presence of allowable subject matter in claims 2, 3, 11, 12, 19-21, 23 and 24. Again, Applicant wishes to thank the Examiner for this identification of allowable subject matter. Accordingly, claims 11, 12, 19, 23 and 24 have been amended herein to become independent claims, each now containing the recitations of its former base claim. Thus, following entry of this amendment, claims 11, 12, 19-21, 23 and 24 should be in condition for immediate allowance based on the Examiner's determination of allowable subject matter.

With regard to the prior art, claim 18 was rejected as being anticipated under 35 U.S.C. § 102(e) by U.S. Patent No. 6,302,542 to Tsao ("Tsao"). For at least the following reasons, this rejection is respectfully traversed.

Claim 18 recites:

A method of providing a volumetric three-dimensional display device, comprising the steps of:

rotating a helical display screen that sweeps out a cylindrical three-dimensional display space;

projecting two-dimensional slices of a three-dimensional data set on said rotating helical screen so as to generate a three-dimensional volumetric display on said screen;

selectively projecting a two-dimensional image that is superimposed on said three-dimensional volumetric display, wherein said selective projection of said two-dimensional image is synchronized with rotation of said rotating helical display screen.

In the recent final Office Action, the response to Applicant's position regarding claim 18 is merely this: "Tsao teaches a projector 2D image (115) generates the slice 2D images reflect on the reflector (26), consequently reflected onto the surface of the helical display screen." (Paper No. 7, page 5). This is correct. Tsao teaches projecting 2D images onto a display screen. These projected 2D images generate a 3D display. (Abstract). ***However, this is only a fraction of what claim 18 recites, as Applicant has tried to point out previously.***

It is important to note that claim 18 recites a set of two-dimensional images (slices of a three-dimensional data set) that are projected on a rotating helical screen to generate a three-dimensional display. ***In addition***, claim 18 recites ***another, separate*** two-dimensional image "that is superimposed on said three-dimensional volumetric display." The additional two-dimensional image can be superimposed on the three-dimensional image because the selective projection of said two-dimensional image is synchronized with rotation of said rotating helical display screen.

In contrast, Tsao fails to teach or suggest the claimed "two-dimensional image that is superimposed on said three-dimensional volumetric display." In this regard, the Office Action indiscriminately cites several large sections of Tsao without providing an adequate

explanation of how or where Tsao teaches the additional 2-D image that is projected *over and superimposed on* the 3-D image being displayed using the other 2-D image slices.

Applicant has carefully reviewed the indicated sections of Tsao, but finds that they only teach a set of 2D images projected to form a 3-D display. There is no teaching of an additional 2D projection that is superimposed over the 3-D image being displayed.

According to Tsao: "By sweeping the screen across the space periodically and rapidly, and sequentially project onto the screen a series of 2D image frames, e.g. the profiles of an auto-body 14a in FIG. 1, the set of 2D image frames can thereby be distributed and displayed over the display space, with each frame located at a specific position in the space. This set of 2D image frames, when viewed from outside the display space, forms a 3D volumetric image." (Tsao, col. 3, lines 34-42).

Nowhere does Tsao teach or suggest projecting an additional two-dimensional image that is superimposed on the three-dimensional image being displayed, as claimed. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. Therefore, for at least this reason, the rejection of claim 18 based on Tsao should be reconsidered and withdrawn.

Claims 1, 4, 10, 22 and 25 were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of U.S. Patent No. 5,162,787 to Thompson et al. ("Thompson") and U.S. Patent No. 6,050,690 to Shaffer et al. ("Shaffer"). For at least the following reasons, this rejection is respectfully traversed as to claims 10, 22 and 25.

Independent claim 22 recites:

A volumetric three dimensional display device with an interactive pointer, the device comprising:

a rotating helical display screen that sweeps out a cylindrical three-dimensional display space;

a projector for projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

a hand-held laser pointer generating a continuously pulsed laser beam which a user directs at said rotating display screen to selectively indicate a point on the three-dimensional volumetric display.

(emphasis added).

Independent claim 10 has been amended herein as a method claim corresponding to claim 22.

Thus, claim 10, as amended herein similarly recites:

A method of providing a volumetric three dimensional display device with an interactive laser pointer, the method comprising the steps of:

rotating a helical display screen that sweeps out a cylindrical three-dimensional display space;

projecting two-dimensional slices of a three-dimensional data set on said rotating helical display screen so as to generate a three-dimensional volumetric display on said rotating helical display screen; and

generating a pulsed laser beam with said interactive laser pointer to selectively indicate a point on the three-dimensional volumetric display.

(emphasis added).

In contrast, the combination of Thompson and Shaffer fails to teach or suggest a pulsed laser pointer that can “selectively indicate a point on the three-dimensional volumetric display” as claimed.

Thompson teaches a three-dimensional volumetric display. Shaffer teaches a laser pointer that is used with a conventional two-dimensional display. The laser pointer of Shafer can simulate a “mouse-click” to indicate selection of a point on the two-dimensional display, by pulsing the laser for a short time at the point to be selected. According to Shafter, the user “activates a momentary push-button switch (not shown) on the light device 12 to create a

light pulse. The push-button switch toggles the light beam on and off for a brief, predetermined time period. The projector/detector 126 can include the detector 16 [to] detect the emulated mouse click” (Col. 8, lines 42-47).

Now, if the Shaffer pointer were used with volumetric display taught by Thompson, the result would be that the laser from the pointer would intersect a line of points through the volumetric display and would likely be reflected and scattered by the moving screen, illuminating additional points in the display. The laser may be pulsed and flash, but the proposed combination would clearly not provide a laser pointer that can “selectively indicate a point on the three-dimensional volumetric display” as claimed. (emphasis added). *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720 (Fed. Cir. 1990) (“An analysis of obviousness of a claimed combination must include consideration of the results achieved by that combination.”).

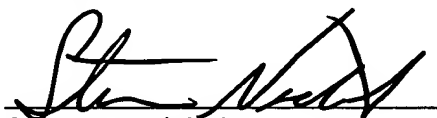
“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). Therefore, the rejection of claims 10, 13, 14, 22 and 25-27 based on Thompson and Shaffer should be reconsidered and withdrawn.

Entry and consideration of this amendment are proper under 37 C.F.R. § 1.116 for at least the following reasons. The present amendment primarily makes changes necessary to place claims 11, 12, 19-21, 23 and 24 in condition for allowance as indicated by the Examiner. The only other amendment, to claim 10, brings claim 10 into correspondence with claim 22 and, therefore, does not raise new issues requiring further search or consideration.

Therefore, entry of the present amendment is proper under 37 C.F.R. § 116 and is hereby requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If any fees are owed in connection with this paper which have not been elsewhere authorized, authorization is hereby given to charge those fees to Deposit Account 18-0013 in the name of Rader, Fishman & Grauer PLLC. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



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DATE OF DEPOSIT: July 16, 2004

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail, on the date indicated above in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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